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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BLEVINS, JERRY M	

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2883	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,979	VANNIASINKAM ET AL.	
	Examiner	Art Unit	
	Jerry Martin Blevins	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8,10-15,17 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14 and 15* is/are allowed.

6)☒ Claim(s) *1-6,8,10-13,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

3DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-6, 8, 10-13, 17, and 18 have been considered but are moot in view of the new ground(s) of rejection.

Specifically, after further review of the US 6,851,870 reference to Deng et al., examiner agrees that the functional element 30 of Deng is not an optical detector in the sense brought forth in the presently claimed invention. However, newly cited US 2004/0258369 to Luo teaches an optical detector offset from the optical axis of an optical fiber (paragraph 39).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent to Cohen et al., number 5,631,991, in view of US Patent to Eide et al., number 5,031,984, and in view of Luo.

Regarding claim 1, Cohen teaches a receiver optical subassembly (Figure 1 and column 6, lines 59-62), comprising a multimode optical fiber stub (Figure 1, element 7 and column 8, lines 29-30) and a lens system (Figure 1, element 3) oriented with respect to the multimode optical fiber stub to focus an optical beam exiting the multimode optical fiber onto an active area of an optical detector (Figure 1, element 4

and column 6, lines 59-62). Cohen does not teach that the fiber stub includes an exit surface polished at an angle with respect to an optical axis of the multimode fiber stub. Eide teaches a receiver optical sub assembly (Figure 9) comprising multimode fiber stub (16), which includes exit surface (Figure 7, element 15) polished at an angle (column 5, lines 17-18) with respect to an optical axis of the multimode fiber stub. It would have been obvious to one of ordinary skill in the art at the time of the invention to polish at an angle the exit surface (as taught by Eide) of the multimode fiber stub of Cohen. The motivation would have been to increase coupling efficiency. Cohen in view of Eide does not teach that the optical detector chip is offset from the optic axis of the multimode optical fiber. Luo teaches an optical detector offset from the optical axis of an fiber (paragraph 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to offset (as taught by Luo) the optical detector chip and the multimode optical fiber of Cohen in view of Eide. The motivation would have been to increase coupling efficiency (paragraph 39).

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen in view of Eide and in view of Luo as applied to claim 1 above, and further in view of Deng.

Regarding claim 2, Cohen in view of Eide and in view of Luo teaches the limitations of the base claim 1. Cohen also teaches that the multimode optical fiber stub is mounted in a stub holder (housing 2). Cohen does not teach that the stub holder is positioned in a receptacle. Deng teaches a receiver optical sub assembly (column 6,

line 39 – column 7, line 27) comprising a fiber (Figure 1, element 20), a lens (Figure 4B, element 13), and a detector (Figure 4B, element 30), wherein the fiber is mounted in a holder (Figure 1, element 21) positioned in a receptacle (Figure 1, element A3). It would have been obvious to one of ordinary skill in the art at the time of the invention to position the stub holder of Cohen in a receptacle as taught by Deng. The motivation would have been to allow the connection of the fiber stub to external electrical connections.

Regarding claim 3, Cohen in view of Eide and in view of Duo and further in view of Deng teaches the limitations of the base claim 2. Cohen also teaches a split sleeve (Figure 1, ferrule 6) positioned over a portion of the multimode optical fiber stub. Cohen does not teach that the multimode optical fiber stub is optically coupled with a single-mode optical fiber. Eide teaches a single-mode optical fiber (14) optically coupled with a multimode optical fiber stub (16). It would have been obvious to one of ordinary skill in the art at the time of the invention to position the split sleeve of Cohen so as to optically couple the multimode optical fiber stub with a single-mode optical fiber, as taught by Eide. The motivation would have been to effectively couple light from a light source through the small core single-mode fiber to a detector via the large core multimode fiber (Eide column 5, lines 48-62).

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen in view of Eide and in view of Luo as applied to claim 1 above, and further in view of US Pre Grant Publication to Richard et al., number 2004/0159776.

Regarding claims 4, Cohen in view of Eide and in view of Luo teaches the limitations of the base claim 1. Cohen does not teach that the lens is mounted on a lens cap, the lens cap being further mounted on a TO header so that the beam is focused on an active area of a detector chip mounted on the TO header. Richard teaches a receiver optical sub assembly (Figure 12b, element 241) comprising a lens (element 210, included in window 208, Figure 12a, page 9, paragraph 73) mounted on a lens cap (206), the cap being mounted on a TO header (header 202 with TO pins 204a-d, Figures 12a, 9a) so that the beam is focused on an active area of a detector chip (Figure 12a, element 214) mounted on the TO header. It would have been obvious to one of ordinary skill in the art at the time of the invention to mount the lens of Cohen in a lens cap further mounted on a TO header as taught by Richard. The motivations would have been to protect the lens and to connect the assembly to external electrical connections using the TO pins of the header (page 1, paragraph 8).

Regarding claim 5, Cohen in view of Eide and in view of Luo teaches the limitations of the base claim 1. Cohen does not teach that the lens is a ball lens. Richard teaches a receiver optical sub assembly comprising a ball lens (element 210, included in window 208, Figure 12a, page 9, paragraph 73) mounted on a lens cap, the cap being mounted on a TO header so that the beam is focused on an active area of a detector chip mounted on the TO header. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a ball lens as taught by Richard as the lens of Cohen. The motivation would have been to provide an economic focusing system.

Regarding claim 6, Cohen in view of Eide and in view of Luo teaches the limitations of the base claim 1. Cohen does not teach that the detector includes an avalanche photo diode. Richard teaches a receiver optical sub assembly comprising a ball lens mounted on a lens cap, the cap being mounted on a TO header so that the beam is focused on an active area of an avalanche photo diode detector chip (Figure 12a, element 214) mounted on the TO header. It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the optical detector of Cohen an avalanche photo diode as taught by Richard. The motivation would have been to increase receiver sensitivity (page 1, paragraph 5).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen in view of Eide and in view of Luo as applied to claim 1 above, and further in view of US Patent to Kato et al., number 5,737467.

Regarding claim 8, Cohen in view of Eide and in view of Luo teaches the limitations of the examiner treated base claim 7. Cohen does not teach that the angle is about 8 degrees. Kato teaches an optical assembly (Figure 5a) comprising a fiber (140) and a detector (131) wherein the fiber is polished at an angle of about 8 degrees (column 10, lines 27-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to form the angle of Cohen in view of Eide at about 8 degrees, as taught by Kato. The motivation would have been to reduce reflection light (column 10, lines 31-32).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen in view of Luo.

Regarding claim 18, Cohen teaches a receiver optical subassembly (Figure 1 and column 6, lines 59-62), comprising a multimode optical fiber stub (Figure 1, element 7 and column 8, lines 29-30) and a lens system (Figure 1, element 3) oriented with respect to the multimode optical fiber stub to focus an optical beam exiting the multimode optical fiber onto an active area of an optical detector (Figure 1, element 4 and column 6, lines 59-62). Cohen does not teach that the optical detector is offset from the optic axis of the multimode optical fiber. Luo teaches an optical detector offset from the optical axis of an fiber (paragraph 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to offset (as taught by Luo) the optical detector chip and the multimode optical fiber of Cohen in view of Eide. The motivation would have been to increase coupling efficiency (paragraph 39).

Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eide in view of Zhong .

Regarding claim 10, Eide teaches a method for receiving light in a receiver optical sub assembly (Figure 9) comprising coupling a light beam (column 5, lines 48-62 and column 6, lines 15-23) from a single-mode optical fiber (Figure 9, element 14) into a multimode fiber stub (Figure 9, element 16) and focusing the light beam (using lens 36, Figure 9) onto an active area of an optical detector (Figure 9, element 30 and column 7, line 13). Eide also teaches a single-mode optical fiber (14) optically coupled with a

multimode optical fiber stub (16). Edie does not teach a sleeve wherein the sleeve aligns the single-mode optical fiber and the multi-mode fiber stub. Zhong teaches a sleeve (Figure 2A, ferrule 214) coupling light from a single-mode optical fiber (204) into a multi-mode fiber (206). It would have been obvious to one of ordinary skill in the art at the time of the invention to position the sleeve of Eide so as to optically couple the multimode optical fiber stub with a single-mode optical fiber, as taught by Zhong. The motivation would have been to more effectively and easily couple light from a light source through the small core single-mode fiber to a detector via the large core multimode fiber.

Regarding claim 11, Eide in view of Zhong teaches the limitations of the base claim 10. Eide also teaches that the method includes providing an angled exit surface on the multimode fiber stub (Figure 7, element 15 and column 5, lines 14-15) and positioning the active area of the optical detector (30) to compensate for the angled exit surface (column 6, lines 59-63).

Regarding claim 12, Eide teaches a receiver optical sub assembly (Figure 9) comprising means for receiving a light beam into a multimode fiber stub (by coupling a light beam from a single-mode optical fiber 14 into a multimode fiber stub 16, column 5, lines 48-62 and column 6, lines 15-23) and means for focusing the light beam (using lens 36) onto an active area of an optical detector (30). Eide also teaches a single-mode optical fiber (14) optically coupled with a multimode optical fiber stub (16). Edie does not teach a sleeve wherein the sleeve aligns the single-mode optical fiber and the multi-mode fiber stub. Zhong teaches a sleeve (Figure 2A, ferrule 214) coupling light

from a single-mode optical fiber (204) into a multi-mode fiber (206). It would have been obvious to one of ordinary skill in the art at the time of the invention to position the sleeve of Cohen so as to optically couple the multimode optical fiber stub with a single-mode optical fiber, as taught by Zhong. The motivation would have been to more effectively and easily couple light from a light source through the small core single-mode fiber to a detector via the large core multimode fiber.

Regarding claim 13, Eide in view of Zhong teaches the limitations of the base claim 12. Eide also teaches means for increasing the return loss characteristics of the receiver optical sub assembly. Specifically, Eide teaches a multimode fiber stub (16), which includes exit surface (Figure 7, element 15) polished at an angle (column 5, lines 17-18) with respect to an optical axis of the multimode fiber stub.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen in view of Deng and Zhong.

Regarding claim 17, Cohen teaches a receiver optical subassembly (Figure 1 and column 6, lines 59-62), comprising a multimode optical fiber stub (Figure 1, element 7 and column 8, lines 29-30) and a lens system (Figure 1, element 3) oriented with respect to the multimode optical fiber stub to focus an optical beam exiting the multimode optical fiber onto an active area of an optical detector (Figure 1, element 4 and column 6, lines 59-62). Cohen also teaches that the multimode optical fiber stub is mounted in a stub holder (housing 2). Cohen does not teach that the stub holder is positioned in a receptacle. Deng teaches a receiver optical sub assembly (column 6,

line 39 – column 7, line 27) comprising a fiber (Figure 1, element 20), a lens (Figure 4B, element 13), and a detector (Figure 4B, element 30 and column 7, line 24), wherein the fiber is mounted in a holder (Figure 1, element 21) positioned in a receptacle (Figure 1, element A3). It would have been obvious to one of ordinary skill in the art at the time of the invention to position the stub holder of Cohen in a receptacle as taught by Deng. The motivation would have been to allow the connection of the fiber stub to external electrical connections. Cohen also teaches a split sleeve (Figure 1, ferrule 6) positioned over a portion of the multimode optical fiber stub. Cohen does not teach that the multimode optical fiber stub is optically coupled with a single-mode optical fiber. Zhong teaches a sleeve (Figure 2A, ferrule 214) coupling light from a single-mode optical fiber (204) into a multi-mode fiber (206). It would have been obvious to one of ordinary skill in the art at the time of the invention to position the sleeve of Cohen so as to optically couple the multimode optical fiber stub with a single-mode optical fiber, as taught by Zhong. The motivation would have been to more effectively and easily couple light from a light source through the small core single-mode fiber to a detector via the large core multimode fiber.

Allowable Subject Matter

Claims 14 and 15 are allowed.

Regarding claim 14, Cohen teaches a method of assembling a receiver optical sub assembly (Figure 1 and column 6, lines 59-62) comprising: positioning a split sleeve (Figure 1 part of housing 2 extending along ferrule 6) over a portion of the multimode

fiber stub (7), press fitting the stub holder into a receptacle (of which the entrance is labeled as element 10), focusing light received form a lens system (Figure 1, element 3) onto an active area of a detector chip (Figure 1, element 4 and column 6, lines 59-62), actively aligning the active area of the detector chip with respect to the multimode fiber stub (column 2, lines 63-67), and positionally fixing the active area of the detector chip with respect to the multimode fiber stub (column 2, lines 63-67). Cohen does not teach the steps of positioning a lens system in a lens cap, positioning a detector chip onto a header, and mounting the lens cap to the header. Richard teaches a receiver optical sub assembly (Figure 12b, element 241) comprising a lens (element 210, included in window 208, Figure 12a, page 9, paragraph 73) positioned in a lens cap (206), the cap being mounted on a header (header 202 with TO pins 204a-d, Figures 12a, 9a) so that the beam is focused on an active area of a detector chip (Figure 12a, element 214) positioned onto the header. It would have been obvious to one of ordinary skill in the art at the time of the invention to position the lens of Cohen in a lens cap further mounted on a header and to position a detector chip onto the header as taught by Richard. The motivations would have been to protect the lens, to integrate the assembly, and to connect the assembly to external electrical connections using the TO pins of the header (page 1, paragraph 8). However, Cohen and Richard, whether taken individually, in combination, or in combination with the prior art, fails to disclose or render obvious the step of press fitting a multi-mode fiber stub into a stub holder.

Claim 14 is allowed based on its dependence from claim 14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMB

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